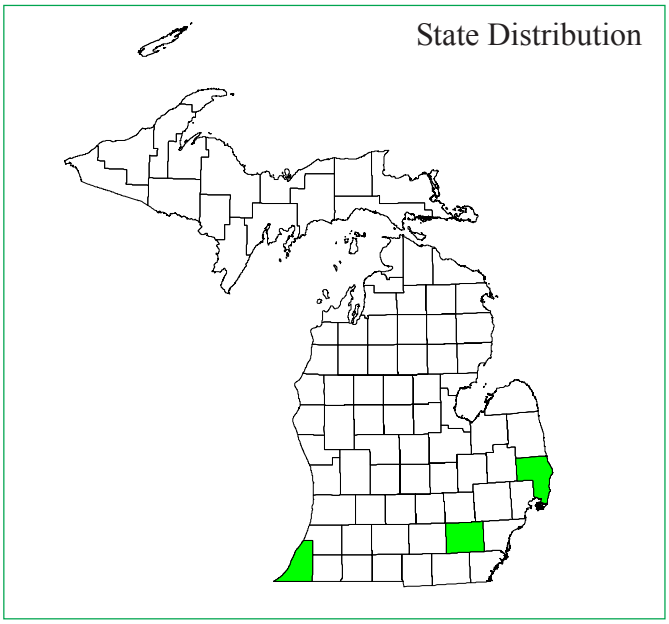
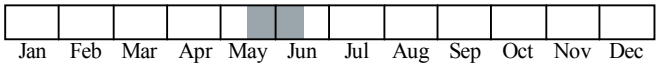
Trillium undulatum Willdenow — painted trillium

Photo by Thomas G. Barnes @ USDA-NRCS PLANTS Database



Best Survey Period



Status: State endangered

Global and state rank: G5/S1S2

Other common names: striped wake-robin, painted lady

Synonyms: *Trillium erythrocarpum* Mich., *Trillium pictum* Pursh.

Family: Liliaceae (lily family)

Taxonomy: Trilliums are divided into two subgenera: *Trillium*, the pedicellate (flowers on stalks) trilliums and *Phyllantherum*, the sessile (flowers not stalked) trilliums. Having stalked flowers, *T. undulatum* belongs to the *Trillium* subgenus.

Total range: Painted trillium is found in Ontario and Quebec south through New England to eastern Ohio, Kentucky, and the southern Appalachia mountains in the Carolinas and Georgia. It is considered rare in Ohio, Kentucky, Rhode Island, Georgia, and New Jersey.

State distribution: In Michigan painted trillium occurs in fewer than a dozen sites. Only seven occurrences have been verified since 1980, all of which are located within a 30 square-mile area in St. Clair County. Only three of these populations have been noted to have good or fair estimated viability with at least 100 individuals, with most occurrences containing between 10 and 30 plants. An unverified observation has been reported from Washtenaw County (Walpole 1924) and a specimen exists from an 1868 Berrien County collection, but this record is questionable (Case and Burrows 1962).

Recognition: Painted trillium generally occurs as individual stems or in small, scattered clumps. The stems are 2-5 dm tall and are topped by a whorl of **three, ovate leaves, each with a definite petiole**. The single, **stalked, upright flower** is comprised of **three showy, white, wavy-margined petals,** with a **dark pink, inverted V-shaped mark** toward the base of each petal. The common large-flowered white trillium (*T. grandiflorum*), which occurs throughout Michigan, differs from painted trillium in its pure white petals and sessile (unstalked) leaves. However, abnormal *T. grandiflorum* could be confused with *T. undulatum* when infected with virus-like mycoplasmas, which are parasitic, subcellular organisms that often result in the normally white petals being streaked with green or pink, and may even cause the normally sessile leaves to be stalked (Case 1997). Mycoplasma infected trilliums are not uncommon, thus it is useful to become familiar with this condition in large flowered trillium, Michigan's most common and widely distributed species of this genus.

Michigan Natural Features Inventory
P.O. Box 30444 - Lansing, MI 48909-7944
Phone: 517-373-1552

Best survey time/phenology: Painted trillium is best sought when in flower, which usually occurs from mid-May to early June in Michigan. In general, it blooms later compared to other *Trillium* species at the same location.

Habitat: Throughout its range, painted trillium grows only in cool, moist, environments with humus-rich, strongly acid soils. In Michigan, it occurs in low, moist, second-growth woodlands dominated by *Acer rubum* (red maple), *Betula papyrifera* (paper birch), and *Quercus* sp. (oak). It exhibits a strong preference for the tops and sides of hummocks formed by tip-up mounds and for the bases of old *Pinus strobus* (white pine) stumps. Though occurring almost exclusively in southeast Lower Michigan, it is found in sites with characteristics of more northern forests, including associated groundcover species such as *Mitchella repens* (partridgeberry), *Maianthemum canadense* (Canada mayflower), *Gaultheria procumbens* (wintergreen), *Medeola virginiana* (Indian cucumber-root), *Trientalis borealis* (starflower), *Osmunda cinnamomea* (cinnamon fern) and *Osmunda regalis* (royal fern). In addition, large stands of *Tsuga canadensis* (eastern hemlock), also a more northern ranging species, are found within or adjacent to many of the sites. This abundance of hemlock in St. Clair County near the southern reach of its Michigan range suggests that suitable painted trillium habitat may be limited to northern forests remnant from historically cooler post-glacial times, persisting in the lake-moderated climate of Lake Huron in cold pockets and on north-facing slopes.

Biology: Painted trillium is a rhizomatous perennial that emerges from the ground in mid-spring and flowers while still relatively small and expanding. Pollination, if successful, is thought to occur by insects within the first day or two of blooming (Case 1997). Soon after, the petals turn translucent and fall, leaving behind a capsule-like berry that matures by mid summer. Attached to the mature seeds are food bodies known as elaiosomes. Ants collect the seeds and feed on the elaiosomes, discarding the seeds in their tunnels where they later germinate following a double dormancy (Case 1997). In general, trillium seedlings typically appear above ground two springs following seed dispersal, and plants require a minimum of four to five more years of growth before producing flowers, though this may increase if light and nutrients are limited (Case 1997). Painted trillium has been occasionally known to become infected with parasitic mycoplasma organisms, which cause the green striping pattern found in petals of infected *T. grandiflorum* plants. This parasite is capable of spreading rapidly through colonies, and causes mortality over several years.

Conservation/management: Of the seven populations verified extant since 1980, two are protected in properties owned by the Michigan Nature Association, and three others are located in special habitat areas in the Port Huron State Game Area. Outside these sanctuaries, painted trillium is threatened by habitat destruction from rapidly increasing development pressure. On both private and public-owned sites excessive deer densities are also of major concern, as trilliums are a highly favored food, and overbrowsing has been known to drive large colonies of other species of trillium to near extirpation within two to three years (Case 1997). Painted trillium seems to prefer shaded environments, but a study in the Hubbard Brook Experimental Forest found significant increases in *Trillium undulatum* density 10-14 years after a major canopy disturbance (Slater 2000). Though increases in light levels appear to favor this intermediate shade-tolerant species, maintaining an intact canopy to preserve the necessary cool, moist environment is of critical importance and clearing of overstory trees is strongly discouraged. It is also worth noting that all species of *Trillium* are protected by state law and that picking flowers or leaves often results in the death of the whole plant, even if the perennial rhizome is left behind.

Comments: Though very showy and desirable by gardeners, this species is the most difficult eastern trillium to cultivate due to its highly specific habitat requirements (Case 1997). Several forms of painted trillium have been described, including forma *enotatum* Patrick, which lacks the distinctive red V-shaped markings on the petals.

Research needs: Though extensive research has been done on cultivating this and other *Trillium* species, few studies have focused on reproduction in its natural environment. Life history studies of any sort would provide information useful to the conservation and management of this species.

Related abstracts: mesic northern forest, mesic southern forest, large toothwort, cerulean warbler.

Selected references:

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Abstract citation:

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